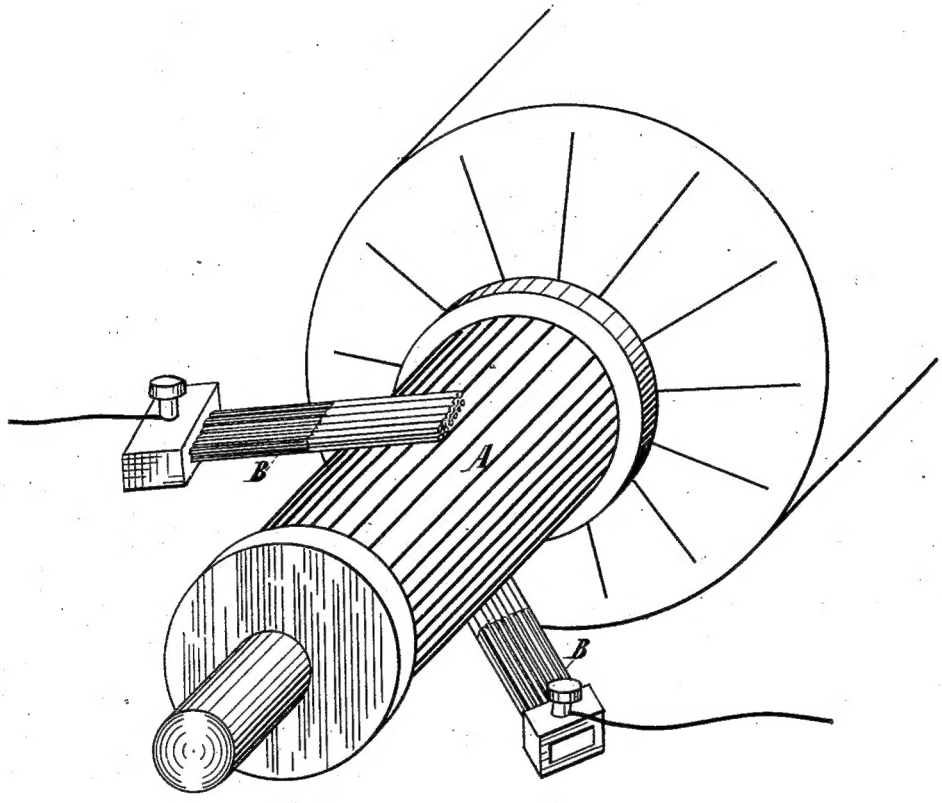
(No Model.)

T. A. EDISON.

COMMUTATOR FOR DYNAMO ELECTRIC MACHINES.

No. 425,763. Patented Apr. 15, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 425,763, dated April 15, 1890.

Application filed November 15, 1881. Serial No. 45,868. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Commutators for Dynamo or Magneto Electric Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

In the use of dynamo or magneto electric machines having commutators formed of copper bars and brushes, strips, wheels, or other collectors, also made of copper and bearing on the commutators, I have found that no matter how smooth the surfaces are made the resistance of the surface contact of the brushes on the commutators is considerable, and sparks are formed which in powerful machines, such as I design to use in connection with my system of electrical distribution, are exceedingly large and keep increasing in size as the commutator is roughened by the destructive influence of the sparks. The great resistance of copper surfaces in contact I have found is due rather to a physical than a mechanical action of the metal.

The object of my invention is to produce commutators and brushes or other collectors for dynamo or magneto electric machines the surface contacts of which will have a very low resistance, so as to reduce the spark to such a degree that it will not burn the commutators or brushes. This I accomplish by amalgamating the face of the commutator, and also the brushes, strips, wheels, or other devices used for collecting the electricity where they bear upon such commutator. The amalgamated surfaces have such an affinity for each other that the resistance of the contact to the passage of the current is low and the spark is very much reduced.

The commutator-bars and the brushes are made, as usual, of copper, which is preferred for its good conducting properties, and the surfaces are amalgamated directly with mercury; or (the preferred way) the commutator-bars and the brushes are faced with silver and afterward amalgamated.

It is evident that the invention has equal advantages when the machine is used as an electro-dynamic motor.

The drawing shows a commutator-cylinder A, upon which bear the brushes B B, said cylinder and brushes being amalgamated.

I am aware of the description in Faraday's Experimental Researches, pages 25 and 26, of the amalgamation of a contact-spring rubbing on a continuous copper wheel. My invention, however, relates to commutators made up of conducting-bars separated by insulation, and here the result attained by amalgamation is different. In my construction sparking occurs as the brushes make and break circuit with the different bars, and the mercury performs the function of carrying off the spark heat by its vapor, thus saving the copper of the bars and brushes, for instead of copper vapor being carried off, which of course would effect the destruction of the copper, mecury vapor goes off and the mercury is readily renewed from time to time. My invention thus relates to a different construction, producing a different or additional result from that of Faraday.

What I claim is—

In dynamo-electric machinery, the combination of a commutator composed of conducting-bars separated by insulation and brushes or current-collectors bearing thereon, the same having amalgamated contact-surfaces, substantially as set forth.

This specification signed and witnessed this 20th day of August, 1881.

THOS. A. EDISON.

Witnesses:

RICHD. N. DYER,

H. W. SEELY.